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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/429,719 10/29/99 ARATANI

K P99.2247

EXAMINER

IM22/0724

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MCDONALD, R

ART UNIT

PAPER NUMBER

1753

DATE MAILED:

07/24/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/429,719

Applicant(s)
Aratani et al.

Examiner
Rodney McDonald

Group Art Unit
1753



☒ Responsive to communication(s) filed on May 12, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-9 is/are pending in the application.

Of the above, claim(s) 3-6, 8, and 9 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1, 2, and 7 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Election/Restriction

1. Claims 3-6, 8 and 9 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 5.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

3. Claims 1 and 2 are rejected under 35 U.S.C. 102(e) as being anticipated by Nee (U.S. Pat. 6,007,899).

Nee teach that a particular silver-based alloy provides sufficient reflectivity and corrosion resistance to be used as the reflective or the semi-reflective layer in an optical storage medium, without the inherent cost of a gold-based alloy. (Column 6 lines 16-21)

The sliver is alloyed with a comparatively small amount of palladium. In this embodiment, the relationship between the amounts of palladium and silver ranges from about 0.1 a/o percent (atomic percent) to about 15 a/o percent palladium and from about 85 a/o percent to about 99.9 a/o percent silver. But preferably in respect to each metal, the alloy has from about 4 a/o percent

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to about 11 a/o percent palladium and from about 89 a/o percent to about 96 a/o percent silver.

(Column 6 lines 30-38)

The above described binary or ternary alloy systems can be further modified by adding another element such as copper, which has an intrinsic reflectivity of more than 90 percent, or rhodium, which has an intrinsic reflectivity of about 80 percent. Copper is isomorphous with gold and palladium, but its solubility in silver is somewhat limited. Rhodium is isomorphous with palladium, but has very limited solubility in silver and gold. Therefore, if a single phase solid solution microstructure is desired in the sputtering target, the addition of copper or rhodium to the above silver-based binary or ternary alloy systems is limited to their respective solubility limits, which is about 5 a/o percent or less. However, this 5 a/o percent limit can be exceeded if a fast cooling rate is used both to make the sputtering target and to apply the target as a reflective film. Thus, in total, the preferred concentration of copper or rhodium as an additive to the above-described silver-based, binary or ternary alloy systems can exceed 5 a/o percent and is from about 0.01 a/o percent to about 10.0 a/o percent. (Column 6 lines 60-67; Column 7 lines 1-11)

Having presented the preceding compositions for the starting materials, it is important to recognize that both the manufacturing process of the sputtering target and the process to deposit the target into a thin film play important roles in determining the final properties of the film.

(Column 9 lines 38-42)

To this end, a preferred method of making the sputtering target will now be described. In general, vacuum melting and casting of the alloys or melting and casting under protective

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atmosphere, are preferred to minimize the introduction of other unwanted impurities. (Column 9 lines 43-47)

The alloys of this invention can be deposited in the well-known manners described earlier. Those being sputtering. (Column 10 lines 7-9)

In Column 11 lines 59 a reflective layer of Ag_xPd_t where $0.85 < x < 0.999$ and $0.001 < t < 0.15$ is taught. In Column 12 lines 1-4 the reflective layer incorporates Cu where the composition of the deposited reflective layer is $\text{Ag}_x\text{Pd}_t\text{Cu}_z$ where $0.0001 < z < 0.10$.

4. Claim 7 is rejected under 35 U.S.C. 102(e) as being anticipated by Ohno et al. (U.S. Pat. 6,004,646).

Ohno et al. teach that to obtain a low volume resistivity in a recording medium a substantially pure Al film having an impurity content of not more than 2 atomic % or a substantially pure Au or Ag film having an impurity content of not more than 5 atomic % is preferred. (Column 10 lines 1-5)

When the above reflective layer is a thin film of an Ag alloy, one containing from 0.2 to 5 atomic % of Ti, V, Ta, Nb, W, Co, Cr, Si, Ge, Sn, Sc, Hf, Pd, Rh, Au, Pt, Mg, Zr, Mo, or Mn, is preferred. (Column 10 lines 23-26)

The present invention have confirmed that with the additive element to Al or the additive element to Ag, the volume resistivity increases in proportion to the concentration of the additive element. (Column 10 lines 29-32)

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The reflective layer is made of a Ag allo containing from 0.2 to 5 atomic % of at least one member selected from the group consisting of Ti, V, Ta, Nb, W, Co, Cr, Si, Ge, Sn, Sc, Hf, Pd, Rh, Au, Pt, Mg, Zr, Mo and Mn. (Column 39 lines 50-54)

The reflective layer is usually formed by a sputtering method. (Column 10 lines 45-46)

The crystallizability or the impurity composition in the layer depends on the method for preparation of the alloy target used for the sputtering and the sputtering gas (Ar, Ne, Xe or the like). (Column 10 lines 64-67)

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

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6. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nee (U.S. Pat. 6,007,889).

Nee is discussed above and all is as applied above.

The differences between Nee and the present claims is that the specific range of elements in the composition is not discussed.

As to the specific range of compositions, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the portion of the prior art's range which is within the range of applicant's claims because it has been held to be obvious to select a value in a known range by optimization for the best results, see *In re Aller*, et al., 105 U.S.P.Q. 233.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno et al. (U.S. Pat. 6,004,646) in view of Takeoka et al. (U.S. Pat. 4,647,947).

Ohno et al. is discussed above and all is as applied above. (See Ohno et al. discussed above)

The differences between Ohno et al. and the present claims is that the specific ranges of elements in the composition is not discussed.


Takeoka et al. teach a metal cover film for an optical recording medium. The metal cover film may be gold (Au), platinum (Pt), Palladium (Pd), rhodium (Rh), indium (In), copper (Cu), nickel (Ni), cobalt (Co), iron (Fe), manganese (Mn), Chromium (Cr), vanadium (V), titanium (ti), zirconium (Zr), Niobium (Nb), and aluminum (Al) as well as silver. These metals may be used

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singly or as alloys of two or more components. These metals may be deposited by sputtering. (Column 7 lines 52-67) Thus, suggesting a range of compositions.

So as to the specific range of compositions, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the portion of the prior art's range which is within the range of applicant's claims because it has been held to be obvious to select a value in a known range by optimization for the best results, see *In re Aller*, et al., 105 U.S.P.Q. 233.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney McDonald whose telephone number is (703) 308-3807.


RODNEY MCDONALD
PATENT EXAMINER

RM

July 21, 2000